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ABSTRACT

This paper develops the argument that rule and inferential models of communication are interdependent--that explanations provided by one model must invoke properties of the other model if a more complete explanation of communication is to be arrived at. Rule and inferential models are examined separately in the paper as to their functions in language usage and their shortcomings. Using Grice's conversational maxims and implicatures, the paper makes the argument that neither model can adequately explain the communication process as both models are interdependent of each other. The paper suggests that communication is a probabilistic process and such a conception of communication should guide future research into communication models. (Contains 45 references.) (RS)

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Models of Communication; The Interdependency of Rules and Inference

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Abstract

Models of communication have traditionally been separated into rule models or inferential models. This is not an efficient way to model human communication as either model can only explain a portion of the communicative act. Rule and inferential models are examined separately as to their functions and shortcomings. An argument is made that neither model can adequately explain the communication process as both models are interdependent of each other. It is suggested that communication is a probabilistic process and such a conception of communication should guide future research into communication models.

Models of Communication: The Interdependency of Rules and Inference

We are constantly engaged is a struggle for meaning. The definitions of communication provided by Barnlund (1962), Burgoon, Buller, and Woodall (1989), Gamble and Gamble (1987), and Tubbs and Moss (1987), assert that we are involved in the transmission of meaning between one another. The linkage between communication and meaning is not the only common item in these definitions of communication, but it is at the heart of the enterprise we attempt to define as communication.

There are many ways in which meaning is purported to be sent from one person to another. There are systems of rules and systems of inference, with the adherents of each system focusing on their method as the best explanation of the way in which meaning is transmitted. Like opposite poles of a magnet, these systems appear to be incompatible with one another. Neither system can provide a complete explanation of the process by which meaning is exchanged. Yet, neither system can completely overrule or subsume the other. The question then arises; are these seemingly incompatible systems of meaning part of a larger whole? And if so, what roles are played by each as a part of a larger system of communicated meaning?

An argument will be developed here that rule and inferential models are interdependent, that is to say that explanations provided by one model must invoke properties of the other model

if a more complete explanation of communication is to be arrived at. Both rule and inferential models will be considered in terms of their usage and problems with their attempts at conveying meaning. The interdependence of rule and inferential models of communication will be examined using Grice's conversational maxims and implicatures. Finally, it will be suggested that communication is an event not of certainty but of probability with meaning being obtained through using rules and inferences to identify the variables in each communication interaction.
In arguing for this view of language usage, some generalizations about the structure and function of communication will be made.

Communication Assumptions

There are several assumptions to be made about communication before moving on. First, it is not the case that complete communication is possible between humans in the way advocated by Saussure (1974). This hypothesis will be developed throughout this paper. Critics of this view will undoubtedly argue that models that make this assertion can never have precision nor allow for complete communication. This view is not being challenged. Rather, the argument being developed here is focused on the reasons for considering rule and inferential systems as being interdependent and necessary within a framework of communication as probabilities.

Secondly, we are efficient at processing information (Sperber & Wilson, 1988). Despite the first assertion made

above, with less then perfect communication we are able to communicate ideas which allow for the machining of metal to micro tolerances, send men into space, and other acts which, by their very nature, require almost zero tolerance in the interpretation of meaning. Are mistakes made in the communication of meaning? The collision of two jumbo jets on an airport runway in Tenerife was attributed in part to a lack of shared meaning between pilots and controllers.

On this note of misunderstandings, Sperber and Wilson (1988) ask if they occur because "the mechanisms of verbal communication are sometimes improperly applied, or because these mechanisms at best make successful communication probable, but do not guarantee it" (pp. 16-17). There is little doubt that we misapply the mechanisms of communication on occasion. It will be asserted here that successful communication is a probabilistic act which requires both rule and inferential modes of deriving meaning and understanding.

A third assumption to be made here is that mutual knowledge is an ideal that people strive for, but mutual knowledge is not always a reality (Sperber & Wilson, 1988). We seek to be competent communicators but are limited by many factors in our search for a common meaning through language.

Meaning

Meaning, and its conveyance, is at the heart of this debate. Sperber and Wilson (1988) argue that "communication is successful

not when hearers recognize the linguistic meaning of the utterance, but when they infer the speaker's meaning from it" (p. 23). Grice (1957) asserted the existence of several types of meaning as used in conversation. Grice classified the first type of meaning as natural meaning, or meanings which have a surface meaning obtainable directly from the text. The second class of meaning Grice designated as nonnatural meaning. Grice sought to illustrate with nonnatural meaning the meaning which may not be easily obtained from just the utterance. There are conditions of intentionality on the part of the speaker to transmit nonnatural meaning to the receiver. The receiver should recognize the intention behind the meaning. The third qualification Grice outlines for the recognition of nonnatural meaning is that there be a reason for the meaning. We will substitute the notion of relevance for reason here.

In a later work, Searle (1969) examines Grice's (1957) notions of meaning in relation to speech act theory. Searle points out that the connection made by Grice (1957) between meaning and intention is an essential part of communication. Among the important aspects of intentionality in communication noted by Searle (1969) is that one can achieve the intended effect of an utterance on a hearer just by having the hearer recognize the intention behind the utterance. Illocutionary force fails however to show how meaning can be a matter of rules or conventions. This failure is part of the dichotomy which

exists between what one actually says in a sentence (literal meaning) and what one intended to say (speaker's meaning) in the sentence. It will be demonstrated that neither rule or inferential models can adequately account for both literal and speaker meanings.

Searle (1969) attempts to illustrate the importance of intentionality with his example of an American soldier in World War II who was captured by Italian troops. The American soldier utters the one line of German that he can remember in the hopes of being seen as a German soldier by his captors. "Kennst du das Land wo die Zitronnen bluemen?" (p. 44). The meaning intended by the speaker is that he is a German soldier but the literal translation of the sentence is "Do you know the land where the lemon trees blossom?" What Searle (1969, p. 44) fails to conclude in the body of the article, but alludes to briefly in the footnote, is that fulfillment of the speaker's intentions are directly related to the listeners ability to make inferences.

Searle (1969) continues on to state that "meaning is more then a matter of intention, it is also at least sometimes a matter of convention" (p. 45). This leaves us in a conceptual fog as to the function of the relationship between intention and meaning. On the one hand Searle implies a need for inference but he concludes with the establishment of a rule model for the production of illocutionary force of a sentence. It will be assumed here that there is a relationship between intention and

meaning, and that there are at least two types of meaning as introduced by Grice (1957); literal and nonnatural meanings.

Bach and Harnish (1979) argue that language can be thought of as conventional in the sense that the meaning of its words is conventional; words mean what we mutually believe them to mean. Bach and Harnish (1979) further define the distinction between conventions and rules. "Conventions are actions that, if performed in certain situations, count as something else" (p. 121). Rules, on the other hand, are socially expected forms of behaviors. Normative sociology sets forth the idea of rules as normative regulations. It is in this context of rules being defined as normative regulations or as socially expected behaviors that we will examine rule based systems of language usage.

Rule Models

Rules organize language structure. Generative grammars are a set of rules or principles designed to provide a complete description of the meaning of a sentence (Sperber & Wilson, 1988). To this end, Chomsky (1957) developed his notions of a generative grammar with the ability to produce precise and formal rules of language usage. We all have a notion of grammar. It is theorized that we develop or internalize the rules of our grammar at a young age. The fact that these words can be spoken or written then understood by another speaker of English is prima facia evidence of the existence of such a grammar.

As explained by Jacobs (1985), "put simply, a grammar describes the logical structure of the relations between meaning and signals that are created by a code" (p. 320). The coding of communication within a rules perspective is supposed to guarantee the identity or sameness of representation (Sperber & Wilson, 1988). In the system outlined by Saussure (1974), this fixed code with which speaker and hearer communicate must be identical or the system will not allow for communication (Harris, 1987). Saussure (1974) described this by his notion of _lange_; that each communicator understands the code of the other communicator completely. There is one type of linguistic code where the constrictions of _lange_ are achieved absolutely; that of writing computer programs. Communication in computer language requires an absolute exactness of syntax and grammar on the part of each programmer for meaning to be shared. Unlike in human communication, inferential processes cannot overcome or substitute for syntactical error in computer communication.

Saussure developed a notion of _parole_ or communicative competence which reflected upon the abilities of a communicator to understand the code being used. The greater the discrepancy between the _lange_ and _parole_ of communicators the less chances there are of successful communication occurring.

Normative code models, using Saussure's notion of _lange_ and _parole_, emphasize the sharing of the same system of rules and a formal encoding and decoding of a message by sender and receiver

(Jacobs, 1985). Such models of communication, which draw upon the framework provided by Shannon and Weaver (1949), describe a linear process of communication that bypasses the idea of intentionality as an aspect of meaning. These models do not tell us how the meaning of the message was realized. Normative code models only outline the process the message went through in being communicated.

Speech act theory (Austin, 1962; Searle, 1965; 1969) attempts to address issues of intentionality with the notion of illocutionary force. As stated earlier, illocutionary force has as one of its requirements intentionality on the part of the speaker for making the utterance. But at the same time, the hearer has the responsibility of securing uptake for there to be communication of meaning (Atlas & Levinson, 1981).

Speech acts follow some of the logic behind sequential rule models of language by occurring in sequences which are related to one another (Ferrara, 1980a). One speech act serves as the impetus for and guides the speech act which can follow. This concept is reflected in the concept of adjacency pairs (Heritage, 1984). An adjacency pair consists of a sequence of two utterances which follow one another and are produced by two different speakers. There is a first pair part (FPP) which is put forth by the first speaker and a second pair part (SPP) which is the response by the second speaker to the utterance of the first speaker (Schegloff & Sacks, 1973; Sigman, Sullivan, &

Wendell, 1986). While the FPP and SPP are connected in a sequential order and need to be in agreement (Jacobs & Jackson, 1983), the SPP doesn't necessarily follow directly after the FPP (Heritage, 1984). Common adjacency pairs include greeting-greeting, requests-grants/refusals, and question-answer. Coordinated sequences of these speech acts can allow speakers to not only share meaning but negotiate roles and status between participants (Ferrara, 1980b). Mohan (1974) argues that sequencing rules explain how orderly social interaction is possible, and that speech act theory provides a model for assigning semantic meaning to these sequences.

The strengths of these various rule oriented systems is in their explanation of how meaning is communicated in specific instances and under specific conditions. Much of how language works is accounted for by these models, especially the generative grammar which is arguably the best code model currently available (Sperber & Wilson, 1988).

Frentz and Farrel (1976) highlight the advantages of rule models in their notion of the reoccurring aesthetic of communication. They write, "our knowledge that questions are logically prior to answers, problems to solutions, causes to effects, etc. enables actors to apprehend the reoccurring aesthetic pattern of communication" (p. 335). But there are several disadvantages to rule models in attempting to account for the communication of meaning.

First, Levinson (1983) argues that a rule or conventional account of language usage can never be complete because that which can be communicated always exceeds the ability of the conventions to define. This point was made more recently and succinctly by Giles and Coupland (1991) who stated that meanings outstrip the referents of the words themselves.

Grammars, as code models, provide no information as to how the receiver uses non linguistic information in determining meaning (Sperber & Wilson, 1988). Consider for example, the following sentence:

(1) Yes, I love you.

This sentence can have different interpretations based upon inflections, pauses, and other non-linguistic cues used by the speaker. Heavy inflection on the word 'yes' can give this utterance the force of an imperative. A rapid or hurried utterance can create meanings of doubt or uncertainty in the listener. Semantic representation of such sentences cannot account for other non-linguistic properties such as time and place of an utterance, speaker's identity, and intentions (Sperber & Wilson, 1988).

There are several criticisms made against speech acts which use a sequential rule model. First, the sequential rule models cannot account for replies or SPP's which do not fit the FPP. For instance, consider the utterance of the following:

(2) Are you coming with us?

The following responses could all be used in replying to the speaker of utterance (2):

(3) Yes.

(4) It is late.

(5) What time is it?

(6) Is John home yet?

There is nothing in the assumptions of sequential rule models to account for the variety of responses to a FPP (Jacobs, 1985; Jacobs & Jackson, 1983, 1989). A second criticism of these models is that they cannot account for the type of speech act which can initiate an adjacency pair (Jacobs & Jackson, 1983, 1989).

Code models, though explanatory in some aspects, are descriptively inadequate for comprehension involves more then just decoding a linguistic signal. Akmajian, Demers, Farmer, and Harnish (1990) identify six major problems with the message model. A message model is not able to account for ambiguous expressions, real world references, intentions, non literal communication, indirect communication, and non communicative uses of language (p. 330). The decoding of these everyday functions of language are accomplished by inferential models of communication.

Inferential Models

Morris saw the pursuit of meaning with language as having three components; signs, syntax, and pragmatics (Fillmore, 1981;

Morris, 1946). The meanings attached directly to the signs and syntax belong within the realm of the rule models already discussed. The realm of pragmatics is what concerns us here. As Levinson (1983) writes, "pragmatics is essentially concerned with inference" (p. 21).

Pragmatics deals with presuppositions, implicatures, illocutionary force, and other implications of a pragmatic nature (Levinson, 1983). The process of inference making can be described as deciding an inference to be true or probably true on the strength of the truth or probable truth of other assumptions (Sperber & Wilson, 1988). This process of deciding truth conditions of inferences is done by starting from a set of premises and moving towards conclusions which follow logically from or are at least warranted by the premises (Sperber & Wilson, 1988).

The following sentences from Sperber and Wilson (1988, p. 10) will be used to illustrate the inferential process in action:

(7) Bill is tall.

(8) Betsy's gift made her very happy.

In sentence (7) there are two problems which confront the listener of this utterance. First is the referential indeterminacy of the name 'Bill'. Which 'Bill' is the speaker referring to here? If both speaker and listener know only one 'Bill' then the problem of indeterminacy cannot exist. But if the speaker or listener have knowledge of more then one person

named Bill then inferences will have to be made as to which person named Bill is being referred to (Green & Morgan, 1981). The second problem with sentence (7) is the semantic incompleteness of the word 'tall'. There is no way the listener has of knowing how tall this person named Bill is. Indeed it is entirely possible that the speaker doesn't know how tall Bill is.

The point to be reinforced here is that language is indexical; it's meaning depends upon extra-linguistic factors (Bar-Hillel, 1970). Sentence (8) further illustrates this point. In sentence (8), the listener is faced with the problem of not knowing who 'her' is referring to. Is Betsy the gift giver who made the anonymous 'her' happy or is Betsy the happy recipient of the gift. We cannot find the answers to these questions by just hearing the sentences and knowing their grammatical structure.

Jacobs (1985) argued that the making of inferences beyond the information contained within the text is "a characteristic process invited by all natural language use" (p. 317). Given the above examples, this argument could logically be extended to state that the making of inferences beyond the information contained within the text is a process necessary if meaning is to be obtained through use of the language.

One of the characteristics of a transformational grammar is that there is a finite set of rules whose differing combinations generate an infinite number of meanings. Many of these meanings have to be generated through inference. Meaning is derived in

part from how a word is used. Yet it would be too inefficient for all of the meanings of a word to be included in every utterance of a word (Bilmes, 1986).

In inferring a meaning of a word or of an utterance, we often look to the context to make our inferences. And context can be seen as including the culture or society in which an utterance is made (Hymes, 1974; O'Keefe, in press). Not every utterance requires examination of the entire cultural context in order to infer its meaning. If this were absolutely the case then we would have the same problem that would exist if all of the meanings of a word were present in every utterance. We would not be able to uncover an exact meaning through the logjam of potential meanings available. So, in the need for efficient processing of inferences we use heuristics to make short cuts (Fiske & Taylor, 1991).

Some of the aspects of culture or context which have heuristic value in making inferences include the conversational setting, and what is known about the speaker or the subject of the utterance (Cicourel, 1980). Another specific way in which we seek meaning for individual words is to look at how they are used within the sentence structure and in the context (Hanna, 1982; Wittgenstein, 1958).

As an example of how we infer the meaning of a word from its usage consider the following uses of the word 'kill'.

(9) You kill me.

(10) I will kill you.

(11) I could kill you.

(12) I got a kill.

In examples (9), (10), and (11), the word 'kill' can have at least two possible meanings given the grammar structure of the utterance, a literal meaning of to take one's life or a figurative meaning indicative of anger or frustration. In sentence (9) the inferred meaning of 'kill' can include a reference to one of the interactants having done or said something very humorous. In each of these cases it is the context of the situation which will determine if there is a real threat being offered or a pseudo threat (10), or if the utterance is said in a spirit of humor or frustration (11). Context is necessary as well to interpret the utterance in example (12). In this example the meaning of the word 'kill' is straight forward enough. The person making the utterance has permanently disabled either a person, animal, or piece of equipment. Further knowledge is needed to accurately discriminate between the possible choices. Knowing that the person is a soldier on maneuvers or in combat may lead to the inference that the person disabled a piece of enemy equipment. Additional knowledge that this soldier is a tank commander may lead to the conclusion that the disabled piece of equipment is a tank or an armored vehicle. Lacking this knowledge we may be led to the more common inference that the person in question is a hunter who has had some measure

of success.

Hanna (1982) argues that there exist words whose meaning cannot be derived from rules or usage. Hanna (1982, p. 39) cites as examples words like 'voting' which he asserts require knowledge of the context in order to arrive at the meaning of the word. Regardless of whether we are trying to infer the meaning of a word, sentence, or utterance, it seems clear that inferences which make use of the context, text structure, and coherence are ways in which we interpret the actions of other people (Green & Morgan, 1981), and seek understanding or shared meaning.

Interdependency of Rule and Inferential Models

Up to this point two systems of obtaining meaning have been examined as if they were separate and incompatible systems. Now an argument will be made that rule models and inferential models can and do have a mutual interdependency with one another. A rationale for this argument will be outlined then Grice's (1975) conversational maxims and implicatures will be presented as examples of the interdependency between rule and inference models.

Verbal communication, or the process of sharing meaning, involves both coding and inferential processes. As Sperber and Wilson (1988) articulate so well, "both code and inferential models are interdependent of one another" (p. 3). There are several ways in which this argument for interdependency can be sustained.

The most direct approach would be to argue that without a code or grammar of some kind inferences would be meaningless. Without a base line structure there can be nothing to infer to or to make inferences from. Without structure there can only be randomness. All inferences are probabilistic in nature, that is to say, they represent a best guess solution to an interpretive problem. And inferences are made in relationship to a structure.

The primary function of grammar is to provide a structure that can contain meaning. Inferences work to extend the meaning which can be contained in a grammar by allowing us to move beyond the surface meaning of words and structure. Yet inferences work within a set of rules of logic whose function is to guarantee the validity of the inferences they govern (Sperber & Wilson, 1988). Two of the most basic rules of logic regulating the inferential process are the law of contradiction and the law of excluded middle (Christensen, 1971). The law of contradiction is the metalogical principle that a proposition cannot be both true and false at the same time. The law of excluded middle states that a proposition is either true or false. It is significant in terms of this discussion about the interdependence of rules and inferential processes that these two basic logical premises seem to be universal conditions for language use in the communicative act (Christensen, 1971).

These fundamental rules of inference are easily demonstrated. Consider the following sentences:

(13) I am at home and at play.

(14) I am at home and at school.

Both sentences are grammatically correct in that they can be written as such within the rules of basic grammar. Sentence (13), awkward as it may be, has two items of information which do not contradict or appose one another. The hearer of sentence (13) knows where the speaker is physically located and what activity the speaker is engaged in. Various inferences about the type of play activities could also be made here. On the other hand, sentence (14) while grammatically correct contains no information for the listener. By the blatant violation of the law of contradiction both items of information in sentence (14) cancel each other out. The hearer of sentence (14) may make inferences about the mental abilities of the speaker but a satisfactory sense of meaning will not be arrived at.

The relationship between rules and inferences can be thought of as a tension between what is explicit and implicit. Hanna (1982) writes, "In their use of language speakers follow rules, but these rules can never be made explicit; rather the rules are implicit in behavior and at best one can specify paradigm cases or exemplary instances of the rules" (p. 39). Inferences can be used as rules for decoding communication but these inferences operate as implicit not explicit rules.

For inferences to be used as decoding rules three conditions must be met (Sperber & Wilson, 1988). First, the speaker and

hearer must share the same tacit premise. Second, the speaker and hearer must share the same inference rule. Finally, the speaker and hearer must use the premise and rule to the exclusion of any other inference rule or tacit premise at their disposal.

Conversational Maxims and Implicatures

To try and tie all this together, consider Grice's (1975) conversational maxims. Grice (1975) sets forth principles for conversation which, if followed, will make and keep conversation relevant. These maxims include principles of conciseness, providing sufficient information, and being relevant. An implicit assumption of these maxims is that both speaker and hearer are always following them during the course of a conversation.

For Grice's (1975) maxims to work both the speaker and hearer must adhere to the maxims. Earlier in this paper, rules were conceptualized as being socially expected forms of behavior. Grice's (1975) conversational maxims function as rules given this context of socially expected behavior. Yet these maxims are also used inferentially especially in determining the relevance of a speakers contribution to the conversation. According to Apostel (1971), "a statement is relevant if believing it or knowing it partially or completely answers some questions that are being asked" (p. 18). We have already seen how statements can have meanings which can answer questions only through inferences beyond the meanings provided by the structure and rules of

conventional usage.

In terms of the third requirement listed above, that speaker and hearer use the rule or premise to the exclusion of other rules or premises, consider the case of flouting of the maxims. Grice (1975) argued that when a speaker is seen as having violated or 'flouted' one of the maxims the listener will infer that there is a deeper meaning present for the speaker would not have flouted the maxim otherwise. This interpretation of the speaker having a rational purpose in mind which can be achieved through flouting of the maxims can be reached logically only when both speaker and hearer use this flouting rule to the exclusion of any other premises. Grice (1975) called the technique of violating a maxim exploitation. And having reached this point, it can be argued that interpretation of the meaning behind a flouted or exploited maxim is obtained through inferences. The rule implicit in the exploiting of a maxim is that there is a further purpose in mind by the speaker or he would not logically have violated the maxim. It is up to the hearer to infer the meaning or intention of the speaker who is exploiting the maxim. In this way the maxims can function both as rules and as inferential processes in determining the intentions and meaning of a speaker.

Conversational implicatures will be presented here as a process which makes use of both rules and inference processes to arrive at meaning. Conversational implicatures were first

proposed by Grice (1975). In Gricean terms, a conversational implicature results from the utterance of a sentence which allows for an inference to be made above and beyond the inherent meaning in what the speaker actually says (Karttunen & Peters, 1979).

Levinson (1983) defined conversational implicatures as references which arise on the basis of general rules or maxims of conversational behavior (p. 10). Levinson also argued that conversational implicatures can have repercussions on linguistic structure.

Dascal (1977) defined an implicature as being a hypothesis about the speaker's intentions that explain away the apparent irrelevance of his utterance by explaining how the utterance is in fact relevant (p. 322). Given this definition, it is easy to see the connection between an exploited maxim and a conversational implicature. Grice (1975) argued that a blatant violation of the conversational maxims leads to conversational implicatures being made on the part of the hearer in order to provide the explanation why the speaker chose to violate a conversational maxim.

In the most parsimonious explanation implicatures are dependent upon rules which serve to provide partial explanations. Rules form the base line of meaning from which we can make implicatures. Grice (1975) stated that a sentence S can conversationally implicate P if and only if P can be calculated. He provides a list of rules which allow for P to be calculated

including that the literal meaning of S is known and that general principles of conversation (maxims) are understood. It ought to be made clear however that if rule models could account for every aspect of language use and meaning then there would be no need for implicatures to move beyond a rule bound meaning.

Second, implicatures must conform to rules such as the law of contradiction if they are to follow logically. It is not fair to say however that inferences are entirely rule dependent. For the purpose of an implicature is to make an inference which can enable the search for meaning to move beyond the meaning contained by the rule structure.

This relationship between implicatures and rules and inferences is explained by Levinson (1983) in the following manner; "For every kind of mutually assumed constraint on language usage, there will be a corresponding set of potential inferences that come about either from the speaker of serving or flouting the constraint" (p. 132). This is representative of the tensions which exist between syntax and pragmatics. It seems clear that conversational implicatures and conversational maxims can not be isolated and explained by only rule models or inferential models of communication. Rather, they are explained by a combination of rule and inferential processes.

Sperber and Wilson (1988) concluded that a general theory of communication is just not possible as "the code model and the inferential model are each adequate to a different mode of

communication; hence upgrading either to the status of a general theory of communication is a mistake" (p. 3). There is little argument with Sperber and Wilson's (1988) position vis-a-vis either model becoming the basis for a general theory of communication. But the next step is to attempt or at least argue for what they claim is impossible; a more general theory of communication to replace what already exists as bits and pieces.

So far, we have outlined the basic tenets underlying rule models and inferential models of communication. The advantages and disadvantages of each model of communication have been illustrated. Then an argument was put forth that rule models and inferential models of communication are interdependent and that the explanatory power of such systems as Grice's (1975) conversational maxims and conversational implicatures derive their force from the interplay between both rule and inferential models. Now suggestions for a model of communication as a probabilistic action will be made.

Communication as Probabilities

After all of the arguments about rule verses inferences we are still left inquiring as to the nature of communication. It's nature is that it is a probabilistic model which consists of making inferences within a rule based framework. With the exception of computer based languages noted earlier, the assumption was set forth that humans are not able to achieve perfect communication in the manner of Saussure's notion of

lange. At best we can achieve parole or competence which allows for shared meaning most of the time.

Dascal (1977) set forth an argument that communication is much like an equation. We gather information then proceed to make inferences which have logical or rule based foundations. Most mathematical theories seek an ordered and absolute sense of precision. An equation seeks to compare things to see if they are logically equal. But as any student of algebra knows an equation can be solved only if the degrees of freedom are one. Only one variable can be free to vary if the equation can be completed with precision. Yet in communication it is the case that many of the variables are free to vary. The context in which an utterance is said, the emotions and intentions of the communicators, and the rule systems being used by the participants are all variables which are neither fixed nor absolutely knowable within the context of natural interactions.

Rule systems provide the underlying logical structure for the functioning of language at a surface level. But the unknown variables are often left for inferences or implicatures to fill in. This view provides a rational reason for why meaning is often not shared between two communicators as they are using different variables in their communication. This view also supports the notion that people can be effective communicators in terms of linguistic competence but vary widely in their pragmatic competence to identify the variables of communication in use

Green & Morgan, 1981).

Such a view of communication as a combination of rule and inferential models suggests a hierarchy of usage. To suggest the existence of a hierarchy of use would require a discussion of cognitive processes which is beyond the scope of this work. But advances in understanding such processes as parallel distributed processing suggest the possibilities that we have the ability to consider both rule and inferential systems simultaneously in our quest for meaning.

The arguments presented here assert the interdependence of rule and inferential systems for obtaining meaning. It is suggested that communication is a process of solving an equation like structure in the quest for meaning which uses both systems, perhaps simultaneously such as is the case in parallel distributed processes. The arguments generated here provide a rationale for different communicative results. But a more thorough explication of such a model of communication as probabilities needs to be developed if it is to provide explanation and understanding of the communicative process.

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